BISS Biodiversity Information Science and Standards

Biodiversity Information Science and Standards 3: e36643
doi: 10.3897/biss.3.36643

OPEN ACCESS

Conference Abstract

# More Than Names: The role of updated taxonomy in palaeontology collections

Ricardo Paredes ‡, §, |

‡ Science Museum – University of Coimbra, Portugal. Largo Marquês de Pombal, 3000-272 , Coimbra, Portugal
§ Procesos Bióticos Mesozoicos Research Group - Complutense University, Spain, Madrid, Spain
| MARE - Marine and Environmental Sciences Centre - University of Coimbra, Coimbra, Portugal

Corresponding author: Ricardo Paredes (ricardo.paredes@uc.pt)

Received: 30 May 2019 | Published: 18 Jun 2019

Citation: Paredes R (2019) More Than Names: The role of updated taxonomy in palaeontology collections. Biodiversity Information Science and Standards 3: e36643. https://doi.org/10.3897/biss.3.36643

## Abstract

The accuracy on taxonomic determinations of palaeontology collections may have significant consequences in estimations of organism diversity through time. This justifies the need of taxonomic standardization of palaeontological collections. The perception of palaeodiversity through Phanerozoic time has significantly improved since the Sepkoski showed the marine invertebrate taxonomic data in diversity graphs, organized in orders (Sepkoski 1978) and families (Sepkoski 1979, Sepkoski 1984). The visual impact of these graphs engaged palaeontologists into gathering quantitative macroevolution in order to better understand marine palaeodiversity. Alroy et al. (2008) presented a rebuilt diversity curve based on genus-level in a large sample record. These and other statistically sound and standardized datasets of fossil occurrences have combined sources as literature, databases, and museum collections data as a foundation. Integration of these datasets with the entire fossil record based on individual specimens in space and time would be the ideal approach to species-level taxonomy standards determinations. An example showing how this approach may be achieved is the use of initiatives such as the Web-based data facility Palaeontology Database (PdB) which includes a large amount of fossil record data from throughout the world. The major advantage of that is to gather institucional and also private palaeontological collections with taxonomy experts validation. The core of these datasets is the taxon, with the species as the expected most reliable unit. Taxonomy is therefore the discipline enrolled in the process with the taxonomist at the centre of the

© Paredes R. This is an open access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

process. Updated taxonomy is crucial to create reliable datasets and a careful approach should prevent biased data due to under- or overestimation of diversity.

Palaeontological museum collections are known to be one of the largest repositories of fossil data. Taxonomic standardization of palaeontology collections in the context of a museum should:

1. Engage taxonomists in revising fossil clades of the museum material;
2. Promote networking and museum researcher peers involved in similar collections activities;
3. Avoid replication of errors in taxonomic determinations (e.g. exclusive use of Web-based databases sources of taxonomy);
4. Use type material to compare with the collection specimens;
5. Critically analyse previous taxonomic determinations on old labels and associated specimen information;
6. Promote the accessibility of the collection to the research community;
7. Emphasize digitisation of specimen catalogue records as well as 2D imaging of the specimens.

These practices are valuable complements to current methodologies adopted to improve the taxonomy of collections, resulting in more reliable data which further enables museum-based research focusing on palaeodiversity estimations.

## Keywords

palaeodiversity, taxonomy, online inventory, fossils, curatorship management

## Presenting author

Ricardo Paredes

## Presented at

Biodiversity_Next 2019

## References

- Alroy J, Aberhan M, Bottjer DJ, Foote M, Fursich FT, Harries PJ, Hendy AJW, Holland SM, Ivany LC, Kiessling W, Kosnik MA, Marshall CR, McGowan AJ, Miller AI, Olszewski TD, Patzkowsky ME, Peters SE, Villier L, Wagner PJ, Bonuso N, Borkow PS, Brenneis B, Clapham ME, Fall LM, Ferguson CA, Hanson VL, Krug AZ, Layou KM, Leckey EH, Nurnberg S, Powers CM, Sessa JA, Simpson C, Tomasovych A, Visaggi CC (2008)

Phanerozoic trends in the global diversity of marine invertebrates. Science 321 (5885): 97-100. https://doi.org/10.1126/science.1156963

- Sepkoski J (1978) A kinetic model of Phanerozoic taxonomic diversity I. Analysis of marine orders. Paleobiology 4 (3): 223-251. https://doi.org/10.1017/S0094837300005972
- Sepkoski J (1979) A kinetic model of Phanerozoic taxonomic diversity II. Early Phanerozoic families and multiple equilibria. Paleobiology 5 (3): 222-251. https://doi.org/10.1017/S0094837300006539
- Sepkoski J (1984) A kinetic model of Phanerozoic taxonomic diversity. III. Post-Paleozoic families and mass extinctions. Paleobiology 10 (2): 246-267. https://doi.org/10.1017/S0094837300008186